PUBLIC WORKSHOP

BEFORE THE

CALIFORNIA CLIMATE ACTION REGISTRY and

CALIFORNIA ENERGY RESOURCES CONSERVATION

AND DEVELOPMENT COMMISSION

In the Matter of:	)
	)
Cement Industry Greenhouse Gas Emissions Reporting and Certification Protocols	) Docket No.)))

CALIFORNIA ENERGY COMMISSION

HEARING ROOM B

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SACRAMENTO, CALIFORNIA

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10:10 A.M.

Reported by:
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Steven A. Regis
California Portland Cement Company

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Mojave Air Quality Management District
(via teleconference)

I N D E X

P R O C E E D I N G S

10:10 a.m.

DR. du VAIR: Well, good morning and welcome all of you to the California Energy Commission here in Sacramento. We've got a public workshop that's jointly put on by the Registry and the CEC. We've done a number of protocol development efforts with the Registry. And I think we'll go ahead and start.

Mike, if you want to just go ahead and take it away and provide an overview, maybe, of the Registry, and then the purpose of this workshop.

MR. McCORMICK: Sure. Okay, good morning. I have spoken with each of you individually. For the record my name is Mike McCormick. I am the Policy Director for the California Climate Action Registry. And I led the protocol development process for our industry specific cement sector protocols.

The objective of the protocols is to provide guidance for cement companies as they produce clinker or cement. And to focus the guidance in this protocol on the calcination of raw materials that produces clinker. This is

called process emissions in terms of the Registry, in context of the Registry and reporting to the Registry. And I will get into process emissions versus stationary combustion emissions which are also a product of cement manufacturing.

I have a couple of slides that discuss what the Registry is and does. We provide a little background from where we came, our general role within the state's climate policies. I will talk a bit about the protocol development process that we undertook to develop this guidance document. And I will also provide a bit of information regarding the document, itself, which is available on the CEC website, as well as the Registry's website.

These are draft protocols that we welcome your comment on. Public comments are due next week, the 23rd, I believe. We have received a set of comments from the Registry's workgroup that was put together to help the Registry formulate this guidance document.

And I'll discuss the members of the review group. And I'll provide an overview of the comments that we have received thus far. When we receive all of our public comments, we will post

those onto the web.

So, I went over this generally. I'll start with a bit of information about the Registry; go into the protocol development process; comments on the draft protocol; and talk about next steps.

So, the Registry was established by the California Legislature in 2000 actually as a business initiative. The purpose of the formative legislation to develop the Registry is to provide an opportunity for businesses to take an accounting of their greenhouse gas emissions and get recognized by the state for their early movers action.

We are a voluntary organization. We all -- all of the members of the Registry report their emissions not according to a mandate, but according to the choices that they have made to understand their carbon profile from the operations in their organization.

We constantly strive for regulatory quality data. There is a balance that the Registry encounters regarding making our program appealing enough such that -- and least onerous, so that we can attract members, but at the same

time it's imperative that we maintain a high standard for our procedures and the data that is submitted to the Registry such that it can be recognized by the state.

And we have achieved a lot of success in this balancing act. And we are generally known as the gold standard for reporting emissions because of the rigor associated with the protocols, themselves; and layering on top of that the certification of the emissions report which is overseen by the Registry.

Our Board represents business institutions, government agencies, as well as nongovernment institutions. The Governor appoints our Board. And, as well, the Senate and the Assembly are also able to appoint our Board.

The Registry operates kind of in a DMZ zone, is how I try to characterize it. While we are an independent, nonprofit, voluntary organization, we, at the same time, have very close ties to the state. The Governor appoints our Board; the Legislature created the Registry. As well, the California Energy Commission here has a large role in oversight of the certification process that is a part of the Registry's program.

As well, the CEC and other representatives from state agencies participate in our workgroup process.

And let me take a moment here; I'm sorry, Tom, I should have done this from the outset. Let me introduce Tom Pyle to the group. He has participated in the protocol development process for the Registry. And he is with the California Department of Transportation, and oversees cement testing and manufacturing. And he will speak briefly later on. And he can introduce himself and talk a bit about his work.

So, finally, regarding overview points about the Registry is that participants that join the Registry, they agree to take annual, entity-level inventory of their emissions.

The Registry, at this time, or in the beginning, we actually -- we see here our general reporting protocol and our general certification protocol. That was developed as the initial guidance document from the Registry to provide general accounting procedures for companies with typical emission sources.

The general reporting protocol not only provides the Registry's reporting rules, that is

the rules that companies follow to define the boundaries of their organizations, and the rules that the Registry has for what is a direct and indirect emission source, geographical considerations. Plus the general reporting protocol also provides the calculation methodologies, themselves, for how a company would calculate the emissions from the sources.

And so when I conceive of the activity of taking an inventory with the Registry, I think of it in two categories generally. There are the reporting rules that a company follows; and then there's also the straight-up calculation methodologies.

And this is an important distinction because with respect to the cement protocol what we focus on is the calculation methodologies, themselves, the reporting rules, i.e., whether to take an inventory of direct plus indirect emissions. That is emissions from fuel use, or emissions associated with electricity use. Those are indirect emissions.

The boundaries that accompany sets when taking an inventory. That's another reporting rule. And still another is the fact that all

participants have to have their inventory certified.

So those are reporting rules that the Registry has that are consistent across all of our reporting protocols.

The cement protocol focuses on the calculation methodologies. How to actually calculate emissions associated with calcining raw materials. And I'll get a bit into that when I talk more specifically about the protocol, itself.

CARROT is the Registry's online reporting tool. It provides a window, a portal, and the means by which a company, when they are reporting to the Registry, they are able to log in their activity data and also provides emission factors and it automates the calculation of the Registry participants emissions inventory. As well, it helps you set the boundaries for your emissions reports.

The general reporting protocol, the certification protocol and the CARROT tool, they support the California or U.S.-wide boundary considerations, direction, stationary and mobile combustion emissions, and indirect emissions from electricity purchases.

Additional guidance that the Registry has developed is for the power sector, for the forestry sector, and now for the cement sector. Those are three examples of Registry-developed, industry-specific protocols.

As well, the Registry has developed one emission reduction quantification protocol that pertains to activities in the forestry sector.

The cement protocol, like the power protocol, the general reporting protocol, only pertain to absolute entitywide emissions. We do not, in this document, provide guidance for how to register reductions associated with clean climate policies undertaken by a cement company.

We are interested and very willing to talk about how the Registry could develop a protocol, what guidance is out there, and gauge the level of support, because we are looking forward to developing reduction protocols and the cement sector could be a target area for that. So, if individuals or organizations have comments and suggestions for how the Registry could develop guidance for emissions reductions, we are very interested in having those talks.

DR. du VAIR: Mike, --

MR. McCORMICK: Yes.

DR. du VAIR: -- this is Pierre du Vair with the California Energy Commission. The same comment came up when we developed the power sector utility protocols. We developed entitywide protocols, but there was great interest in that sector, in quantification protocols for projects in the power sector, as well.

And so I believe the Registry probably goes sort of based on priorities for limited resources and if they've got a lot of members in the power sector, that's likely to be the area that you'll focus on projects first? Or how does the Registry set its priorities for developing project-based protocols?

MR. McCORMICK: There is not a defined process whereby the Registry puts together our project protocols. We identify target sectors that could yield protocols, guidance documents that would enable a calculation of the emissions reductions.

So we look for examples, standards, guidance that has undergone a rigorous review. We also consider the project opportunities for the California sectors, what sectors in California

could yield significant reductions.

We also look to level of interest for companies and project developers to actually put together a project. So there's a whole set of criteria that we consider when we evaluate opportunities for developing emissions reduction protocols.

The exception to that list of criteria that I mentioned is with the forestry protocol. In that we were directed by the California Legislature to develop a protocol. and I believe it was Senate Bill 527 in 2000 --

DR. du VAIR: SB-812, Sher.

MR. McCORMICK: Oh, 812, sorry, excuse me. There's a couple of bills that pertain to the Registry and I get them confused. It said the Registry shall develop a reduction protocol for the forestry sector. So, there we go; so, they told us to do it.

DR. RAU: Can I just ask a question here?

MR. McCORMICK: Sure.

DR. RAU: You're talking about a reduction protocol; in other words, a way of measuring the reduction --

MR. McCORMICK: Sure.

DR. RAU: -- rather than specific technologies for doing that?

MR. McCORMICK: Correct.

DR. RAU: Okay.

MR. McCORMICK: Correct. There are a number of activities that organizations employ to reduce their emissions. In the climate universe emissions reductions and the term emissions reductions and the term project are loaded terms.

They often refer to, and the most strict definition, or conception of these terms, is that they pertain to a discrete activity that was designed and implemented and evaluated for the purpose of reducing greenhouse gas emissions.

There are a number of co-benefits that can also be a part of this activity. But in the climate field, emission reduction projects mean a specific project or activity or combination of activities that have defined boundaries that reduce your emissions for the sake of reducing your greenhouse emissions so that you can register them and then eventually, often the interest is to market them and trade them.

But that's getting a bit far afield from

this workshop. But just to inform the group about the cross-over between entity-level reports and project-level reductions is that multiple entity-level reports can reflect a change of emissions. And that change of emissions can actually go down.

But that doesn't mean that that pertains to an emissions reduction project. In order to register emissions reductions with the Registry it has to be a formal or a discrete project that yields emissions reductions. And we can talk more about that later on in the day, or offline if the group is interested.

So, moving -- Pierre, do you want to add anything to that? Does that characterize that fair enough?

DR. du VAIR: No, I think that's good, Mike.

MR. McCORMICK: Okay.

DR. du VAIR: There has been some confusion about how projects fit in with entitywide reporting.

MR. McCORMICK: Right.

DR. du VAIR: It's even more complex than the forestry sector, so --

MR. McCORMICK: Yeah.

DR. du VAIR: -- the Registry sort of tackled the toughest sector first.

MR. McCORMICK: Right.

DR. du VAIR: But at the international level you might just mention, because people probably are pretty familiar with some of the Kyoto flexibility mechanisms, the clean development mechanism and the --

MR. McCORMICK: Right.

DR. du VAIR: -- joint implementation mechanism. Those are under the United Nations framework convention on climate change. And those are project-based accounting in the international arena under the Kyoto Protocol.

And the GHG Protocol effort at WRI; WCSD also has --

MR. McCORMICK: Correct.

DR. du VAIR: -- a project module. But it's still fairly early on, wouldn't you be able to agree with that, Mike, in the project quantification arenas?

MR. McCORMICK: Yeah, yeah.

DR. du VAIR: It's pretty early.

MR. McCORMICK: I would definitely agree with that, especially with respect to the U.S.

Because internationally speaking probably everyone is familiar with the Kyoto Protocols and the international program that Pierre mentioned, the clean development mechanism. And so that's providing the structure for international projects.

Coming back to the U.S. and emission reduction activities that actually take place within the U.S., the picture is much less defined. It's much more hazy. How do we characterize emissions reductions from projects that actually take place on U.S. soil.

Because there is no mandatory program and we're operating in a voluntary universe, there is no overriding program, program rules, administrator, to lay out the landscape for participants to follow.

So there are a number of organizations, the Registry being one, that are venturing into this field. And we, just to let everyone know, we are trying in earnest to coordinate our accounting procedures, both on the entity level and plus on the nascent project accounting level with organizations in the U.S.

Pierre mentioned one, the World

Resources Institute. There's also Climate Leaders, which is a program run out of the EPA. As well as the Northeast regional greenhouse gas initiative. As well as talks that we're having with southwestern states, Arizona and New Mexico. As well as midwestern states.

So midwestern and southwest, those are programs and areas and regions that are just entering into this discussion. But also speak to the fact that there's no national program in place right now. And so regional efforts are coming up.

DR. du VAIR: This is Pierre again from the Energy Commission. The most parallel organization to you at the federal level is the DOE's 1605(b) program.

MR. McCORMICK: Right.

DR. du VAIR: And so I don't know how closely you've been following their efforts to develop the more rigorous guidance that the President asked them to do back in 2001, but maybe you could mention --

MR. McCORMICK: Sure, sure, --

DR. du VAIR: -- your relationship to DOE.

MR. McCORMICK: Sure. Last time I

checked in with DOE was a couple weeks ago. The DOE 1605 program is a federal registration, greenhouse gas registration program that is run out of the Department of Energy. It is coordinated with a number of climate initiatives that take place on the federal level through the Administration, as well as some industry groups.

I believe the Cement Association, through Portland Cement Association, is participating in one of the programs run out of the Administration and DOE.

The 1605(b) program is the inventory accounting arm of this greater climate initiative at the federal level. It's called 1605(b). There are two parts to it. One is the absolute entity-level emissions inventory side. Plus 1605(b) has also developed guidance for emissions reductions.

Now, the path that 1605(b) has taken has been a reduction in emissions intensity, as opposed to a reduction in absolute emissions. On the entity-level side, where there is a close correspondence with the Registry activities, there is little deviation from the 1605(b) guidance and the Registry guidance as far as reporting your absolute entity-level emissions.

Previous versions or previous rules from 1605(b) did not require participants to take an entity-level inventory. There were also other choices that the 1605(b) program allowed that the Registry did not allow. I believe they also included indirect and direct emissions, and other boundary considerations.

Since then the 1605(b) program has revised their guidelines for taking an absolute entity-level inventory from their programs. And it closely corresponds with the Registry's guidance, according to the reporting rules, and then also on the calculation methodology side.

Now, I'm not saying they're exactly the same. There are some differences, a key difference being certification. The Registry requires all of our participants to receive certification from an independent third-party verifier. That is recommended in the 1605(b) program, as well as in other programs, but it's not an obligation on the reporters.

But the reporting activity, the reporting exercise is the same. As well as the reporting or the calculation methodology that 1605(b) has developed for cement companies,

likewise is the same as the Registry's methodology.

So, that's just a bit of overview of the different Registry activities that are going on in the U.S. And I'm happy to talk and field any more questions about where we fit into the national scope, as well as the international scene.

We're taking our cues from national programs, as well as international programs, in an effort to take advantage of what they have learned and what works for them. Plus also to coordinate how to work with the different entities.

Moving on, this is just a couple of bullets. I won't spend too much time here because we discussed this a bit. The Registry was created in 2000 by SB-1771. There was cleanup legislation subsequent to that in 2001, SB-527. Pierre mentioned the bill SB-812 that required the Registry, or ordered the Registry to develop forestry protocols, as well as to develop emission reduction protocols, or forestry emission reduction protocols.

Other requirements are key requirements that the statute that speaks to the Registry includes efficiency metrics. We include an

efficiency metric in the Registry's protocol. We included an efficient metric in the power protocol, more than one efficiency metric.

And we believe that, like other registries, that the efficiency metric is a key informative tool that is useful for our reporters, themselves, as well as viewers of the emissions reports. Because it normalizes an entity's emissions over a common unit of measure.

And with respect to cement companies it's CO2 emission over cement produced. And it can be used by the cement company, by our other reporters to demonstrate any improvements or updates or modernization to their cement manufacturing process, which actually yields less CO2 emissions.

And so they can demonstrate that as they grow as a company, they are also becoming more climate friendly, so to speak. And this can also reflect changes in the cement manufacturing process, itself, as far as the calcination of raw materials. As well as the fuel used, the fossil fuel used to generate energy to run the operations, as well, the kiln, itself. Plus other operations in the cement plant.

I think I've mentioned this more than once. Indirect emissions reported separately from direct emissions, but all companies are required to report both their direct emissions, which come from sources that are owned and operated by the entity; plus indirect emissions which come from purchased electricity or steam or heat from the entity's utility.

All companies have the option to set a baseline which allows them to compare future or previous emissions inventory according to a baseline which they believe reflects their typical operations.

I mentioned this before, again, as well. The last bullet, all companies are required to have an independent, third-party verifier review their emissions reports.

The certifier undergoes a review process, an approval process that is conducted by the CEC, as well as the Registry. The third-party verifiers have to demonstrate that they are knowledgeable about the field in which they're reviewing, and plus that they are knowledgeable, informed about GHG emission calculations generally, as well as the Registry's process.

So, we ask a lot out of our certifiers, and we also ask that once they have become approved that they undergo a conflict of interest review to make sure that there are no possibilities for a perceived conflict.

We believe this is a key benefit with the Registry for reporting emissions with the Registry. Because what it demonstrates to the public ultimately is that the reporter has volunteered to submit their inventory to a rigorous review. It has passed. And now it has the stamp of approval that an independent, third-party can verify that the procedures, the mechanisms, the management systems are well put together, are free of any discrepancies with the Registry's reporting rules, and that the reporter has passed this rigorous review process.

And a number of our Registry participants have received great value from advertising that they have been subjected to this review and passed.

There is a three-step process involved in taking an inventory with the Registry. First you inventory your emissions according to our protocols, which, as I said, contains both the

reporting rules as well as the emissions methodologies, the calculation methodologies.

Importantly for cement companies, if it turns out that the cement companies break up the process whereby they produce cement. Emissions reports do not include emissions from product use.

After taking an inventory, Registry reporters get their emissions certified according to or after review by approved certifiers, and then they report their aggregated data according or through CARROT, and which becomes available on the Registry's website.

Okay, industries in which we're involved in is the power utilities. We have developed a reporting protocol for that sector. Forestry, we've developed a reporting protocol, as well as a project reduction protocol.

We're also aiming to develop a entitywide absolute protocol for natural gas transmission and distribution companies. Also included within that guidance document will probably be emissions from storage. That protocol development process has not gotten underway. We have had a series of conversations with other registries, other interested parties, business

organizations, environmental organization, other accounting organizations. And we believe that the process will start early in the next year.

Here cement has been a target sector for the Registry largely because it's a large point source of GHG emissions. There has been, on the street, accepted industry guidance for how to tabulate the emissions from the cement processes, so that we believe the protocol development process would be rather straightforward.

And then lastly we're also -- one of the key sectors that we're looking for, or that we're looking towards developing a guidance document for us, also oil and gas. And that generally pertains to production and refining.

So I think I have one more slide on general Registry issues. Companies choose to participate in the Registry for a number of issues. Here is a selection of them.

One is to build on their existing voluntary efforts which they use to market and educate the public, their clients, their suppliers, their product users, about their environmental stewardship.

As well, and this is key for a number of

the Registry participants, is that by registering your emissions with the Registry, you gain a seat at the table to shape the development of the protocols, themselves. As well you have the Registry participants find that their statements to the state and other organizations carry more weight if they can point towards their climates or their registration activities that they have undertaken.

As you are probably aware, in the summer Governor Schwarzenegger articulated climate reduction, or greenhouse gas reduction goals for the state. And has tasked the California EPA, as well as the CEC, and a number of other state agencies to lead a climate action team to develop an implementation plan to meet these reduction goals.

They have had a series of meetings, some public workshops. And during those public workshops they take public comments.

The organizations that have recommended a voluntary approach over a mandatory approach, they have found that those comments carry more weight when they can demonstrate that they are actually taking voluntary action to reduce their

emissions.

Companies that recommend the voluntary approach but have yet to take any action, the climate action team can perceive those as comments to stall the process. And this is actually -- I'm relating an exchange that actually occurred at one of the climate team meetings with a petroleum representative.

As well, there is general agreement that the CO2 and greenhouse gas emissions will be eventually regulated at some point in the future, although there is no national policy as of yet. There is an international policy. And at some point in the future the general consensus is that the U.S. will take some sort of action.

Early action to manage your regulatory risk, the first step involves measuring your GHG emissions. A cliche that has become standard in the climate and the Registry world is that you can't manage what you don't measure. And so that's where the Registry comes in.

DR. du VAIR: Mike, this is Pierre.

MR. McCORMICK: Yeah.

DR. du VAIR: You should mention a little bit that some of the states have taken some

mandatory or regulatory control on CO2.

MR. McCORMICK: Sure. In the northeast the regional greenhouse gas initiative has been over the past two years, I believe, developing a program to reduce emissions from power generating sources within the northeast. It's a collection of eight northeast states that goes down as far south as Maryland. And then all of them north, I believe.

They are developing a model rule which will then be put to the participating states for them to accept the emissions reduction targets associated with that model rule. We can talk more about -- and this greenhouse gas initiative, but it will be the first coordinated greenhouse gas reduction program in the U.S. And it employs a cap-and-trade policy tool to address this issue, which is a policy tool that California is considering as it's developing an implementation plan for its reduction targets.

As well, Oregon has a policy to reduce or to offset emissions associated with new power plants that are coming online. And the Oregon Climate Trust is the organization responsible for designing and leading the emissions reductions

quantification process to offset the emissions from the new plants.

And I believe there's also a system in Washington, but I'm not that well informed about Washington. Is it somewhat like --

DR. du VAIR: Offset 20 percent, yeah.

MR. McCORMICK: Okay.

DR. du VAIR: Lifetime CO2 of a new power plant, --

MR. McCORMICK: Okay.

DR. du VAIR: -- I think based on a 30-year lifetime, so --

MR. McCORMICK: Okay.

DR. du VAIR: -- it mostly focused on the power sector --

MR. McCORMICK: So it's like Oregon Climate Trust.

DR. du VAIR: -- so far in other instates. And then, of course, California our Air Resources Board just adopted a motor vehicle greenhouse gas standard, so --

MR. McCORMICK: Right.

DR. du VAIR: -- that's under legal challenge.

MR. McCORMICK: Right. So, moving on,

there's a couple of bullets here; we can talk about them if there are any questions regarding more corporate disclosure; regarding the carbon footprint of companies. And then companies also want to recognize future business opportunities, and that corresponds with regulatory policies and cap-and-trade and reduction opportunities, in large measure.

Okay, so turning to the agenda, I think what I've done here actually is done a bit about 1 and 3, and probably taken a bit of material from Pierre who is going to talk about Roman number II, the role of the state, Registry and stakeholders in greenhouse gas reporting.

And actually I don't have a floppy drive.

DR. du VAIR: Have we got another hard drive for that? I thought we had a permanent hard drive in here. If not, I can wing it.

(Pause.)

DR. du VAIR: That's okay. I'm going to provide just a little bit of background for the role of the state. But, before I do that, since we have such a small group here, why don't we go ahead and we should have done this a little bit

earlier, but go around the room and let's all introduce ourselves.

Why don't we go ahead and start up over here.

MR. LOZANO: I'm Mike Lozano with the CEC. I work in natural gas.

MS. HAGGARD: Desirea Haggard from TXI Riverside Cement.

MS. FACCA: Gina Facca, Hanson Permanente Cement.

MR. REGIS: Steve Regis from California Portland.

MR. PETERSON: Todd Peterson with Sacramento Municipal Utility District.

DR. RAU: I'm Greg Rau; I'm with the University of California and also Lawrence Livermore National Laboratory. And involved in some CO2 mitigation research there.

MR. McCORMICK: Mike McCormick with the California Climate Action Registry.

MR. PYLE: Tom Pyle with Caltrans.

MR. MAGNANI: Bruce Magnani with The Houston Group.

DR. du VAIR: Very good. I'm Pierre du Vair with the California Energy Commission.

MR. McCORMICK: Pierre, let me ask one question to the group.

DR. du VAIR: Sure.

MR. McCORMICK: Are there people still on the phone line. I think it's Richard. Richard, are --

MR. WALES: Still here.

MR. McCORMICK: Has there been any newcomers to the phone line?

That was Richard Wales from the Mojave Air Quality Management District.

Has participants in this group participated or followed the protocol development process from afar? I know that Tom Pyle participated in our review group. Richard Wales also participated in the review group.

California Portland Cement, they at one point, was participating in the review group, but kind of faded off. So I mean I don't know, John Bennett was the individual, but I understand he's no longer there. So, I don't know if it just got dumped into your lap.

MR. REGIS: Well, that pretty well sums it up.

MR. McCORMICK: Okay.

DR. du VAIR: Thanks, Steve.

Okay, well, I think Mike's done a great job to give some background on the Registry. I'm going to give a little bit of background on the Energy Commission, it's role in relationship with the Registry.

Here at the Energy Commission we have a number of functions related to climate change. The Energy Commission's been working on this topic since we were directed to look at it by the Legislature back in 1988. Then Assemblyman Byron Sher asked the CEC to look at what's climate change going to do to the state, to its economy, to agriculture, things like that.

And to begin to think about some potential strategies for the state to deal with climate change. That was way back in 1988. So, we've had a number of reports out of the Energy Commission since that time.

One of the things we did was start to do a top-down statewide greenhouse gas emissions inventory. The very first year that we looked at emissions was 1988. I think we came out with a report about two years later in 1990, on what the state's greenhouse gas emissions were in '88.

Looked at some interesting other greenhouse gases. I think chloroform or some substances that we typically don't look at anymore, with the class of Kyoto Protocol gases now.

But we've updated that statewide inventory a number of times. The most recent one we completed was 1990 through 2002. I think we're close to finishing the 2003 inventory, and we're hoping to try and do a statewide emissions inventory every year.

This will help us monitor progress towards the Governor's targets. Those targets are to try and reach 2000 emission levels by 2010 in a growing state with both population and economy growing. It's challenging just to stabilize emissions. Same thing at the national level.

And then to reach 1990 level emissions by the year 2020; and a much more aggressive target for 2050, mid-century, to cut emissions by 80 percent below 1990.

So those are the targets. And we're looking for reductions, we'll need to look for reductions in every sector of the economy from residential to commercial to industrial to the

public sector. And then, of course, transportation is our biggest source here in California.

The Energy Commission has two primary programs that it's developed. One is an R&D program and climate change. And because we have a very good public goods charge that can fund R&D through electric utilities ratepayer funds, we've got about $62 million a year that we fund in R&D here at the Energy Commission through our PIER program, our Public Interest Energy Research program.

Within that program they have six programmatic areas. One of them is environmental, and climate change gets lumped in under environmental. Although I keep trying to resist the environmental label because climate change is extremely economic. But often labeled as an environmental issue, which, like I say, is as much or more economic than it is environmental.

But within the environmental arena in the PIER program they fund about $5 to $7 million a year in climate change research, which is great for a state R&D program to have that much resource dedicated to climate change. It really helps

California be a player in the federal climate R&D, which is a big effort.

A number of federal organizations you may be familiar with, like NOAA and NASA and -- well, there's a whole host of federal agencies that deal with climate change. Of course, DOE and a lot of the labs do a lot of great work. And we work quite a bit with the national labs out here in California.

So, we have an R&D program. Good website that can take you right to all the types of R&D that we're doing on climate change. Everything from trying to predict much more regional level effects of climate, downscaling, global circulation models, down to see if we can try and predict the long-term weather in California a little better.

But that's a tough one, obviously, for adaptation and planning. You sort of have to know what's going to happen to figure out how you have to adapt. So that's a high priority for our R&D program.

As well, though, we have a climate change virtual research center. And it's really comprised of large scientific effort out of

Scripps. And then much more on the economics at UC Berkeley. And they are looking sort of on the policy side, the mitigation side. And to attempt to quantify some of the types of measures that we might be able to implement.

Besides the R&D here we have a climate policy program that's housed in our transportation division. But it really crosses all the divisions here, everything from energy efficiency, as a greenhouse gas impact, to renewable energy, to types of facilities and power-generating facilities, and fuel vapor and things. So climate change policy is really cross-cutting here at the Energy Commission. A small group is housed in the transportation -- well, the fuels -- what is that, we keep changing the names of our divisions. But I think for the fuels and transportation division.

And we are the group that supported the Registry over the last four, almost five years. And provide a lot of technical support, as much as we can to the Registry. And work with a lot of the other state agencies that are taking great interest in climate change, particularly over the last decade. So that's sort of a quick overview of the state.

Now, let me jump into what the state views as some of the goals for the voluntary Registry. We do believe that the State Registry can support a national effort. There's a lot of talk about how states are the, what is it, not the proving ground or the trial ground for democracy, but --

MR. McCORMICK: The Petrie dish.

DR. du VAIR: Yeah. States really can try a lot of different things. And if it fails, well, you only failed at one state, and the other states can learn from that.

And so one of the great things about this California Registry is that they have been able to take some positions, whereas I think the federal voluntary registry, trying to work on a consensus mode, it's much tougher to make some decisions. And to try some things. Whereas this California Registry has been able to kind of, you know, make some calls on some boundary settings and things like that.

So, good opportunity to try out greenhouse gas inventorying and reporting rules and see how well they work for members. And so we certainly see that as one of the key goals of this

voluntary registry.

To try and promote participation in early action. That was in the legislation. It was hoped that the members would join this and find out what their emissions are; find out that they can potentially cut emissions and, in some cases, save a lot of money if it's saving energy.

We believe the Registry can improve greenhouse gas accounting from bottoms-up. We focus here on the top-down statewide inventory. But, in the end, the most accurate inventory is going to be from the bottoms-up at the individual source level.

Much of our statewide inventory is based on aggregated data that's reported, mandatory reporting in the oil and the power sector to DOE. So we get a lot of our data from USDOE.

But for things like agriculture, for methane emissions in agriculture, and to, you know, our State Department of Agriculture, we have some fairly good data sources compared to other states. So we don't strictly rely on federal aggregated data for our statewide inventory.

The role of the state, the legislation, SB-1771 did say the state will give appropriate

consideration to certified emissions results that follow protocols adopted by the Board, the Registry. And so it's not very clear what appropriate consideration means, but it is clear that entities that do quantify their emissions and follow the protocols and report them, in the event that the state develops mandatory greenhouse gas reductions and that these organizations that have been making reductions and quantifying their emissions are going to receive some consideration for their early action.

The state has to provide technical guidance to the Registry, and we are very happy to have Caltrans, Tom, joining us here on this one. We really need to reach out to the other state departments, California Department of Forestry and Fire Protection was instrumental in the forestry protocols. And the Air Resources Board is looking at automobile, the motor vehicle greenhouse gas rules. And there is a role for the Registry there in protocols for early action with the automobile greenhouse gas rules. So the Air Board has been pretty active. And so it's great to have Caltrans join this effort, as well.

So as we move into agriculture, the

California Department of Food and Ag will be there to help us, whether it's soil carbon sequestration or methane reduction at dairy facilities and things. So it's a multi-state effort here.

And the Registry is able to -- we try and help coordinate the other state agencies working with the Registry.

And then we've provided quite a bit of financial support to the Registry and the State Legislature, as well, has provided a lot of financial support.

Membership is starting to rise at the Registry. I think they're up to over 60 members now. The power sector and generators and utilities are very well represented. But a lot of the other sectors aren't. Universities are starting to join; I think they've got two or three now. A couple of the UCs, San Diego and Davis, I think, just joined.

Let me see, more specific roles of the state. We were, as Mike mentioned earlier, the state's required to develop a process to preapprove third-party organizations as either certifiers or to provide technical assistance.

And so we've gone through that process a

couple of time and there is a list on the Registry's website of companies that are preapproved by the state and the Registry to provide both technical advice as well as certification verification services to the Registry.

We've just put out a call for new certifiers and are going to go through another round. We found that we needed to create a regulation because when we affect business entities, we were told by our staff counsel, we need to do it in a regulatory format. So we recently had some regulations approved on how we go about approving independent, third-party certifiers and technical assistance providers.

So, we're following those new regulations and I think the closure period is November 18th for any new certifiers. And we do have a number of firms that are interested in becoming certifiers.

As Mike mentioned, a lot of entities outside the state are looking towards the California voluntary Registry as a good model for how to build inventories and verify those results.

What else. Mike mentioned efficiency

metrics. The state really has a role in helping the Registry work out efficiency metrics. He did also mention that the federal approach by the Bush Administration is to try and reduce the intensity of greenhouse gas emissions in the U.S. economy. Recognizing that the economy is growing, and so the focus there is on emissions per dollar of, you know, gross domestic product.

The state, I think, is going to look at both absolute emissions and intensity levels. So, emissions per dollar of gross state product would be one indicator. But also concerned about absolute emissions within, or total level of emissions within the state. When it comes to the atmosphere, the atmosphere focuses on total, absolute emissions, not intensity.

But in any event, efficiency metrics is a really important thing here. It's recognized in the state statutes. And when the Registry develops industry-specific protocols, I think it's specifically called out that the Registry is also able to look at intensity metrics and require their members report information related to emissions intensity.

And it is a good way for members that

are growing, so their absolute emissions may be going up, but yet they can show that their emissions per product are going down. So, it's a valuable effort for all parties to focus on.

We do oversee the certification process. The state can go on site visits with certifiers and we monitor the certifier, as well as look at the data, the member and we are to report to the Registry on who then reports to the State Legislature on a periodic basis on how well the certification process is going.

We have not yet developed our first report to the Registry, although we're close. We have three or four -- well, three case studies, working on a fourth one. And then hopefully early next year we'll probably develop the first report on the oversight of the certification process.

Last year was really the first big year for reporting at the Registry. They had, I forget, Mike, how many reported last year, but -- and I know you expect about over 40 this year to report.

MR. McCORMICK: Yeah, I think it was high 20s last year. And we expect mid 40s this year. There are 55 companies that are currently

members of the Registry, or give or take a couple.

DR. du VAIR: And the last one I'll mention is that one of the roles we see with working with this Registry is to promote the compatibility of this State voluntary Registry with other states, federal and international levels. And I think the Registry Staff, they do a great job in coordinating with others, recognizing that many of the members that have joined the California Registry are large companies that have, you know, activities in other states and across the U.S. And a number of them are significant international activities.

So it's called for in the legislation that our State Registry also try and monitor what's happening, along with the state agencies, at the federal and international level.

So, with that I'll turn it back over to you to finally get into the specifics of this cement protocol.

MR. McCORMICK: Okay, thanks, Pierre. Are there any questions this far about what the Registry is and does, what we're about? Our role in the state and general inventory questions?

That's fine if there's not. I tried to

express earlier when I was talking about Registry general matters, and describe the twofold, or the two elements of taking an inventory with the Registry.

One is adhering to the policy program reporting rules; another one is following the calculation methodology, itself. And the Registry reporting rules, many of them are specifically laid out in the Registry's enabling legislation. And a few subset of them are, there's parameters in the legislation. Which means that the Registry is unable to alter our program in a way that is inconsistent with our enabling legislation. This comes into play for reporters most often with respect to certification.

The protocol development process is to develop guidance for how to calculate GHG emissions from producing cement. And then focus specifically on the calcination of raw materials.

We are unable, through our review group, to workshop away issues or concerns that companies might have about joining the Registry, about obtaining certification, about whether or not to take an inventory for direct emission plus your indirect emissions. That is not -- well, it's not

possible unless we change the legislation. And so therefore it's not within the scope of the protocol development process.

The Registry requires that all participants take an inventory of all direct, all significant direct emissions from stationary combustion sources, from mobile combustion sources, from fugitive emission sources and from process emissions sources, as well as indirect.

But back to the direct, the focus of this document and this effort is on process emissions, where emissions arise not from burning fuel -- well, they do arise from burning fuel, of course, to power the kiln, but in addition to that out of the stack comes CO2 from converting lime and other raw materials into clinker. From converting CACO3 to CACO plus O2, CO2, I mean.

So that is the process whereby GHG emissions come about through the calcination of raw materials. We have specific guidance that would lead reporters to record their input data such that they can calculate those process emissions. And we separate and make distinct that calculation from the stationary combustion emissions.

We realize that in a cement kiln, and then coming out of the cement kiln you can't distinguish between the CO2 from burning coal or natural gas from the CO2 from calcining clinker.

DR. RAU: Actually we can, but --

MR. McCORMICK: Can you --

DR. RAU: -- that's a different story.

MR. McCORMICK: Okay. Fair enough there. And I should also inform the group that I am not an engineer; I'm not a technical expert. What we do with our work group process is that I manage the process; and then we also bring in technical experts from the state, as well as business representatives, as well as independent consultants such that they can advise and inform the Registry so that we do not go astray with providing guidance that would lead to an accurate entity report.

And building upon the work that has already been done, the Registry adopted the approach for calculating CO2 from clinker production that was produced according to the world business council for sustainable development. The cement sustainability initiative has produced what has become, as far as I

understand, the industry standard for accounting for GHG emissions for cement manufacturing.

We have straight-up adopted that calculation approach. What we did in addition to that was layer on top the Registry's reporting rules. You need to have your report independently verified. You need to account for direct plus indirect. You need to define your boundaries according to the Registry's reporting rules.

What I call that is the California-ization of the standard calculation methodology that out on the street right now. And ultimately what this enables is to standardize accurate entitywide reporting of GHGs, both direct and indirect, stationary combustion, mobile combustion, process emissions, purchased electricity.

What a reporter would do would rely on the guidance provided both in the general reporting protocol, as well as in the cement protocol. And so the cement protocol is an appendix to the general reporting protocol. It augments the guidance in that document with sector-specific guidance on calculating process emissions from cement manufacturing.

Our review group members consist of cement companies, Lehigh, CeMex, California Portland Cement, as well as Holcim wasn't a core review group member, but they also -- I've had a number of conversations with them and they have provided comments to me.

State agency representatives include the California Department of Transportation, the California Air Resources Board, and a number of Air Quality Management Districts in California that are currently responsible for regulated emissions in the state.

As well on the review group was World Resources Institute, which is the organization that administers the umbrella greenhouse gas protocol initiative, of which the World Business Council for Sustainable Development, that's CSI, protocol, is one of their calculation tools.

So the CSI protocol is adopted by the World Resources Institute as a calculation tool within their program. As well, NRDC participated in the review group.

Industry Associations include the Portland Cement Association, and the EPA Climate Leaders also participated in the group.

The process to develop the cement protocol started with a draft protocol, itself. The Registry's two other forays into developing industry-specific protocols, the power utility protocol, the forestry protocol, followed a somewhat different approach.

It's difficult because of the uniqueness of a number of sectors, because of the complexity associated with taking an inventory from large industrial facilities, it's difficult for the Registry to operate a protocol development process in the same way for each sector.

We have had a number of conversations with cement companies as we try to inquire about their level of interest in joining the Registry. And what they informed us is that we do not have a protocol that would enable them to take an inventory of their emissions. And they also advised us that industry standard is the World Business Council for Sustainable Development.

We have done a number of -- we did some background review in which we consulted with cement companies, trade organizations, PCA, that is, the climate leaders which has adopted the cement sustainability initiative, the clinker-

based approach. As well as other organizations, and informed us that the CSI CO2 protocol is -- there's little controversy about the methodology contained in it. It's the accepted industry standard. It meets the rigor review from different Registry agencies.

And therefore the approach that the Registry decided to do was to take the first step outside of the review group and produce a draft protocol. Now, it was draft-only. All parts of it were open for comment, for feedback, for questions, for criticisms. And it is that foundation document that we used to bring together a work group.

So we formed a work group in June of this past year, and we conducted two group line conference calls to discuss the Registry, itself, what it is and does; to provide the back story to the review group about us to the review group participants. Also provided opportunities for them to have feedback on the document and the calculation methodology, itself. Any inconsistencies or deviations with the cement sustainability initiative document. Any errors or problems with the examples with the calculation

approach.

The feedback and the conversations that we had allowed them to ask questions about the Registry's reporting rules versus the calculation methodology, itself.

We fielded questions about how the value of certification, how to avoid certification, which we said that it's a key feature and a requirement of the Registry. And so it's imperative to take on independent verification.

As well, we received written comments from a number of review group participants. These were uniformly editorial in nature. Because we adopted the industry standard, people and participants felt as if the methodology was consistent. I think I had some calculation errors in my example, and maybe a typo. But for all intents and purposes the methodology was solid.

And some participants merely replied with a thumbs up, that they have no problems with the protocol, the methodology, itself. They see no deviation with WBCSD. And so therefor their comments are that it's a go.

Other comments were clarifying comments that helped me describe the process a bit more

clearly in the document. And these came from EPA as well as the World Resources Institute; Holcim also provided a bit more substantial feedback.

But, there again, the comments from the cement companies were that the methodology, itself, was solid, and that there was a few clarification issues that I should take note of. All comments, once we receive all of the comments, they will be posted on the Registry's website, and then also the CEC's website, I believe.

Any comments or questions from this group about our protocol development process? How we inform the group? How we pulled the group together? Any questions about who members on the group are, or their interest?

DR. du VAIR: I have on question on the phone.

MR. McCORMICK: Sure.

DR. du VAIR: Did we lose Richard from Mojave?

MR. WALES: No, I'm still here.

DR. du VAIR: Did we have another join on the teleconference? Okay.

MR. McCORMICK: Did someone chime in?

DR. du VAIR: I thought so.

MR. McCORMICK: Okay. So the gentlemen from California Portland Cement, I hope you don't mind if I just put you on the spot. We have a small group, we're rather informal. California Portland Cement was part of the review group.

Were you brought up to speed about what we were doing?

MR. REGIS: California Portland has been involved in greenhouse gas reporting since the mid 1990s with the EPA and the DOE. We've been filling out the EPA 1605(b) reporting forms since it was a beta test.

I guess we've -- I've had a chance to read quickly through the draft protocols and, as you say, they seem to follow the WBCSD pretty closely.

MR. McCORMICK: Right.

MR. REGIS: And we think that's probably the right way to go. Our parent company, Taiheiyo, is filling out and submitting the forms for the WBCSD and we submit forms to them, data to them.

The biggest problem that I have is the independent certification. I'm extremely reluctant to let an outside company come in and

see -- this is extremely sensitive data. And I'm just reluctant to go there.

MR. McCORMICK: Sure, sure, fair enough. Thank you. Sorry for putting you on the spot. A quick response regarding the independent certification. There is confidential agreements that are available, that companies can enter into with anyone that sees their data.

The Registry does not publicly disclose any confidential data that the reporters would, you know, sensitive information about their company entity-level CO2, GHG emissions are all that we provide. But we can talk offline about, you know, about that.

DR. du VAIR: Mike, as --

MR. McCORMICK: My interest is not to convince companies to join the Registry at this time. I'm not trying to market --

DR. du VAIR: You have a number of members that also have highly confidential data, like some of the utilities and the generators and British Petroleum, and things like that.

MR. McCORMICK: That's correct, that is correct.

DR. du VAIR: So there are some that

also have --

MR. McCORMICK: Yeah, sure.

DR. du VAIR: And Borax all have proprietary concerns.

MR. McCORMICK: Right, right, yeah, so there are mechanisms that Registry reporters and the reviewers have in place to maintain the confidentiality of any sensitive information from the companies.

The Registry is a voluntary organization. There's no obligation for any company to join the Registry. The development of a protocol does not strong-arm any company into joining the Registry.

We believe that there is a lot of value in joining the Registry. And the availability of a protocol would make it possible for companies to join the Registry should they so choose.

Go ahead.

DR. RAU: I have a question. How much of an entity's report is public information?

MR. McCORMICK: The level of units of participation in the Registry is at the entity level. Meaning that if an entity has more than one facility in the state, they are only required

to publicly report the entity-level emissions according to the different emission sources.

So on an entity level they report their stationary emissions. On an entity level they report their global emissions. On an entity level they report their process emissions.

But if you have a plant in northern California, southern California, in the desert or something like that, you don't have to distinguish emissions from those facilities.

However, it's more informative to provide the detail at the most granular level possible. So there's more value for companies to disclose to the public their facility level emissions. However, that is not a requirement. We encourage facility level emissions reports, but we cannot require it, and we do not.

However, when you --

DR. du VAIR: You could, but you don't.

MR. McCORMICK: Yeah, I guess.

DR. du VAIR: The current protocols don't require it. But I would also add, once members have been in the Registry for three years, they also have to report on each of the six Kyoto Protocol classes --

MR. McCORMICK: Thanks.

DR. du VAIR: -- of gases, so they will be reporting the four direct emission sources, indirects, and based on each gas of the six classes --

MR. McCORMICK: Right.

DR. du VAIR: -- at the entity level.

MR. McCORMICK: Right. Yeah, so for the first couple years it's only CO2. Starting year four it's CO2, methane, nitrous oxide and the other six, which probably, for this sector, are not very relevant.

I was going to say one more thing. Oh, regarding the entity-level and facility-level reports, when a reporter or Registry participant is actually taking an inventory, doing the work, they gather data on a facility level, of course. But that is just not reported.

So, where are we? Have we gone through some --

DR. du VAIR: Can we see, Mike, if anybody else from the cement industry has experience creating a greenhouse gas emissions inventory at all? It sounds like Portland has worked with 1605(b), the federal program, to

inventory projects or entity-wide emissions?

MR. REGIS: Both.

DR. du VAIR: Both. Great. Anybody else here from the cement industry that's looked at their CO2 or greenhouse gas emissions?

MS. FACCA: When I worked for Holcim US, we did.

DR. du VAIR: Um-hum, Holcim.

MS. FACCA: But for my current company, no.

DR. du VAIR: I think it's one of the sectors that's been more progressive on looking at their greenhouse gas emissions, like the power sector.

MR. McCORMICK: Yeah, through the trade organization, the Portland Cement Association, I believe the cement sector is participating in a federal program called climate vision, in which they are taking on the responsibility to reduce their emissions intensity by 18 percent.

And there is a broad participation in the sector to achieve this goal. And the guidance that the companies follow is through 1605(b), I believe, which adopts the CSI, the clinker-based methodology that we rely on, as well. So there is

consistency there as far as the reporting guidance.

Hold on, let me scan through. I want to give Tom Pyle the opportunity to weigh in and to talk, to provide a bit of information to the group, to the extent that you see fit, about the document, itself, about your review, about the calculation methodology and other thoughts that you might have.

So, let me turn it over to Tom Pyle for a moment and then we'll continue along with the process.

MR. PYLE: Well, I don't have a lot to add, you know, from what our input and what our level into this was is that at Caltrans we have pretty extensive testing laboratories for cement and aggregate, and ultimately concrete.

We are under the belief that we have, of State Department of Transportation, probably, at least that we're aware of, the only pretty rigorous cement testing laboratory in the country. So I think we kind of just fall into being able to work with you all.

Just for what it's worth, we keep a five-pound baggie of cement off every concrete

project we build, whether it's the San Francisco-Oakland Bay Bridge, or whether it's a sidewalk in Barstow. We keep a five-pound baggie. And it allows us to -- we hold it for three years. We have quite a facility where we store them. It allows us the ability to go back if there is any sort of a problem.

Now in California, as you all know, there's a limited number of producers. And every eight weeks our goal is to go through and test every supplier of cement in California for a number of properties, whether it's strength or blends fineness. You know, we run an autoclave for those of you who that means anything to. We just monitor properties.

Gosh, I got to say the production in California is outstanding in terms of its quality. The quality of the product which is produced in California is exceptional. For those of you who are here from cement companies, I really appreciate the opportunity to say that, for you all to hear what we feel about that, because what we see coming out of the state's production is an outstanding product.

DR. du VAIR: Tom, could you clarify, do

you also sample or periodically monitor imported cement? I don't know how much is imported versus domestically produced instate.

MR. PYLE: All of it that's used in our facilities. So, if Hanson is bringing in product from Siam, we are testing it. Frankly, we test the imported cements more rigorously than we do the California cements.

You know, so we have a number of scientists and engineers on board of our staff who are pretty knowledgeable in terms of cement science. And so we've looked through this, and not from the standpoint that Mike and others are, in terms of getting folks into the Registry. But from the standpoint of does it make sense, does the calculation work, does the calculation -- is it fundamentally sound. And our group believe that it is.

We also look at it from a broader standpoint, not just the cement, but from the concrete, itself. And there's a group of us out there whoa re really interested in greenhouse gas reduction. And the ways that we can not only make better, longer lasting concrete, but also use cements that are adding to greenhouse gas

reduction.

We are very active in a number of arenas in terms of specifications that work to reduce greenhouse gas. And it's interesting from my standpoint in that the mechanisms that reduce greenhouse gas are also very green. For those of you who work with concrete or supply concrete or supply cement, you know what I'm speaking of.

But for those of you who don't I will take a moment to say that there are waste products which are ground, granulated, blast furnace slag, or fly ash, which is a waste product. When we use those in our concrete we actually make better, longer lasting concrete.

And so we feel that we can not only make better concrete, we can make concrete that's more disease-resistance, to use very basic terms. We can stop cancer before it happens in concrete by adding in this waste product called fly ash or slag, or a number of other products, as well. So the whole greenhouse gas reduction for us is even larger than this, the cement.

But we really see ourselves in this process as being independent. I suppose Switzerland, as you would. That we feel that the

process is good and valid.

The companies that are in California we can work with, that are with you, to participate in this Climate Action Registry in some way, we would really like to be a partner to help in whatever way we can, to help cement companies, to broker them, or in some ways to help you all participate in this.

I am sure that for some of us who are the members of the employees of the larger state agencies, we will, at some point, be participating as agencies in the Registry, where we have.

You know, at the concrete lab our fleet of 140 vehicles, you know, it all adds up. And I'm sure that, you know, you look at Caltrans' thousands of vehicles. We will be participating in this.

MR. McCORMICK: The CEC is already a member of the Registry.

DR. du VAIR: CalEPA and the CPUC, the Public Utilities Commission, there's a number of state entities, and some universities, as well, have already joined. And others, like Forestry, are looking into it.

It's potentially challenging record

keeping when you have a lot of different sources and things. Municipalities, in particular, I think, have noticed that some challenging record keeping, like the City of L.A. in terms of all of their sources. But, --

MR. PYLE: We, on a global view, which I think is more than the Energy Commission's view, is that when we look at the energy emissions we look at it at Caltrans from the standpoint of even to the point of delay user costs. That if we're out having to rebuild a highway, that the delay in user costs and all of the idling which occurs of vehicles sitting there is a concern to us.

We have incentives and disincentives for contractors who are working where, you know, if you're out working and you have that lane -- you have your lane open late, there's going to be delays of vehicles sitting there, which is inefficiencies.

So we have $1000-a-minute penalties to our contractors for opening it up typically after 5:00 or 6:00 in the morning if you're in the metropolitan areas. We demand that they get off the road early.

But at the same time we're really

constrained on trying to have a product that is going to last for a long time. We've moved the design of our bridges from a 50-year design life to a 75-year design life. We've moved the life of our concrete pavements from a 20-year design life, where we now have 75 percent of our concrete pavements that had a 20-year design life are now into 40 to 50 years. So we are logically moving our design life of our concrete pavements up to 50 to 60. We're even use precast elements with a 100-year design life of our pavements. If the Romans could do it for 1000, we can certainly do it for 100.

So it's a much broader view, which I think is all ties us together in different facets way beyond cement. I mean I will publicly say that I am very aware that Caltrans has a difference with cement companies, cement-producing companies in product.

You all feel this greenhouse gas saving, maybe some of you do, for limestone. Our concern is what if that product doesn't last as long, and what if we don't meet our 50- to 75- to 100-year design life on what we feel is a diluted product.

So there's a lot that needs to be worked

out there. But, on the same, you know, we, as an agency, are looking at more and more concrete pavement, because we believe that the concrete option is going to get us a lot better savings in terms of greenhouse gases, because you don't have to go out and reconstruct, than the asphalt option.

The asphalt option is more often used because it is cheaper. But when we looked at the life cycle cost analysis, it fails miserably.

So we work with the Concrete Pavement Association, American Concrete Pavement Association, to really be pushing our designers to be building more and more concrete. So hopefully that is a sign that the cement companies, that we're working together on an option.

But we appreciate the opportunity to review this. We think it is a solid foundation. And as comments come in, yeah, there's always new ways to do it. And for some of you companies who are really involved in the day-to-day and the production analysis of the cement, if you see a different way to do it, we would love to work with the Climate Action Registry to see if there's easier, more straightforward, better, if that's

the way you all look at it, methods of calculating your emissions, your calcination process, or otherwise, to participate in the Registry.

DR. du VAIR: I've got a question for you, Tom. In terms of who sets standards for cement. Because I'd heard something about local jurisdictions versus state versus federal. And it's all unclear to me, sort of how, you know, standards for properties or whatever for cement are established.

MR. PYLE: That's a real good question. It's a broad question. I think I can finish by 2:00.

(Laughter.)

MR. PYLE: But the states, as a rule, typically will set the properties they're looking for, and they will typically do that through strength.

So a designer, an engineer will say I'm building a product, whether it is a highway or a bridge, whatever it may be in between, when they say in order to make this product work I need a surface strength.

And then they will rely upon a number of different specifications. Whether it's our own

specifications or it might be an ASTM -- is that a term you're familiar with? ASTM is now a acronym which is undefined, although it used to be the American -- now that it is international, it is no longer considered to be the American Society of Testing Materials.

They can also go, in terms of highways we could go to AASHTO, which is the American Association of State Highway Transportation Officials, or we could go to a number of building codes which exist, where it might be what's called the green book. There's dozens of architectural, that we're looking for specifications of strength.

Then what would happen is once you have your strength specified is that you'll go perhaps to a testing laboratory; you will work to come up with a concrete that will meet the specified requirements. And the specified requirements become more complex depending upon the environment that you're going into, or the design life you're working on.

For instance, if you're talking about the San Francisco-Oakland Bay Bridge where we have steel reinforcement, then we're becoming -- you're building concrete in a salt water environment;

you're trying to keep the chlorides from going through the concrete, so you have to have a much denser concrete with more cover to it.

But then again, as you're talking about building a bridge, and you're building that structure where you have 500 feet in each direction concrete hanging, you need properties of creep or modules elasticity beyond strength.

And so then within that environment the materials designer will be going through a process of making mixed designs with aggregate, with rock, to determine that you can get those properties. Every single mix that is made, you know, our fathers made it as a 5-3-4, you know, as a scoop of rock and a scoop of sand and a scoop of cement, or however that may have gone. And now it is a very exact science which includes admixtures to provide -- to make water go further and cement go further and add properties.

I'm not really speaking in specifics, trying to speak in generalities, but concrete is -- - if you go here in Sacramento, the Teichert plant. They have 999 mix designs at their plant. And the only reason they have that few is because the computer they have only holds that many.

And if you were whoever you are and you call up and you say I would like concrete to have these particular properties, you know, they're going to say are you placing at night; how soon do you need that strength; are you placing under water. You know, you just start to go through and you say, well, I'm going to have trucks, I'm going to have overloaded trucks; or I'm going to be in a harsh environment; or I'm going to be building a canal bottom. Or whatever it may be, you need real specific properties that would require different mix designs.

DR. du VAIR: But I think so -- you started that all by saying it's actually at the state level that many of those standards are set.

MR. PYLE: I'm sorry. I'm sorry. I can go off --

DR. du VAIR: That's --

MR. PYLE: For Caltrans it is at the state level. And we recognize that there are a lot of cities and counties, other states and other countries that rely on specifications that we use.

And therefore, we go through a pretty rigorous process of preparing our specifications.

DR. du VAIR: Is there a role for local

governments or federal government?

MR. PYLE: In our process?

DR. du VAIR: Well, --

MR. PYLE: Yeah, well, the Federal Highway Administration is very much a part of us. And the review process, and they review our product. We also send it out to the Cement Promotion Council and the American Concrete Pavement Association. And other industry rock product groups where cement companies and manufacturers are a part of our review.

MR. McCORMICK: Thanks, Tom. So this is another slide regarding back to the protocol development process. And then we'll open up the discussion for comments on the document, itself, if participants in the room or over the phone have them. And I promise not to call on anyone individually this time.

Written comments are due to the Registry on November 23rd for individuals or organizations that have not yet provided comments. The state agency, as well, is conducting a review that will be coordinated between the CEC, as well as Caltrans, or the Department of Transportation, excuse me.

DR. du VAIR: And AQMDs if they have comments.

MR. McCORMICK: Yeah, the AQMDs, if they have comments. So the state agency review is a combination of the CEC providing feedback and comments post work group development. Other state agencies and regulatory agencies have participated in the protocol development process, itself.

After we have received and incorporated all the comments we will present the protocols to the Registry Board for consideration. And that could be done as early as December of this year, December 14th.

And then once we have the protocols on the streets, eligible companies, cement companies that join the Registry, they must use the guidance that is adopted by our Registry Board. And that would include both the general reporting protocol as well as the cement protocol.

The objectives of the cement protocol, itself, -- and then I'll talk a bit about the objectives of the cement protocol development process -- is that we're developing reporting methodology for complete, consistent, transparent and accurate reporting.

There are a number of principles that have been established that actually tie the different registries throughout the country and beyond together. And those principles are generally the complete inventory of a reporter.

Another principle is consistency across time between a reporter's year-one report and then subsequent reports. Also consistency across different companies.

Another principle is the transparency of the methodology in which the inventory is developed. And then crucially the accuracy of the report so it reflects the actual emissions coming out of the entity, and it paints a clear picture.

These principles are adopted -- sorry about this blue bullet, I was thinking obviously of something else. Not the power and natural gas utilities. I don't know how it sneaked in there.

We strive for consistency between the different reporting entities that exist. And that is done through adopting a consistent set of principles which we just went over.

And the protocol, as well, is that it identifies relevant issues for project-based emissions reductions which could be addressed in

subsequent work groups. We talked a bit about that earlier.

The protocol development process, it's important that as we develop the reporting document, itself, we maintain current Registry mandates which are articulated in the enabling legislation, which I mentioned earlier.

And then also key to this process is that we stay consistent with the accepted industry standard, i.e., the CSI initiative CO2 protocol from the World Business Council of Sustainable Development.

And then we identified key GHG accounting issues specific to the cement sector. And then recommended the appropriate calculation methodology. Generally, emissions, the two main sources of emissions are fossil fuel combustion to operate the kiln and the drying facilities, as well as the crushers. And then the process emissions associated with the calcination of raw materials.

The protocol development process. We also encourage a broad spectrum of views. We ask industry groups to participate, companies, themselves, environmental organizations, other

registries, as well as regulatory agencies.

So we believe that the Registry's work group process, which is one of the cornerstones for how we have developed solid and well respected protocols is a key feature of our program.

We're proud that the protocol development process includes such a broad spectrum. And that representatives from all the different viewpoints not only participate in the review group, but also provide comments and feedback to the Registry.

So, that's about all that I have that I envisioned talking about yesterday when I was developing ideas for today. We reserved four hours just in case there was a lot of individuals, a lot of discussion. But we never really anticipated that it would be that long. And we thought it would probably be a two-hour process. So we're relatively on schedule.

I refrained from getting into the actual calculation methodology. I believe the group is informed about the clinker-based approach. Or if the individuals here are not, the representatives from your organizations are familiar. The cement companies, themselves, I'm sure know worlds more

about this than I do. And so I decided against providing the calculation, itself. What the Registry is and about is more informative.

So, let me wrap up with comments about next steps. We look forward to comments, public comments from all stakeholders. We will coordinate the state agency review, wrap that up. We have a Registry Board meeting mid-December; look for announcements from that. I believe December 14th. Will take place here in Sacramento.

We are considering presenting the protocols to the Board at the time for approval, but that is not definite. If it occurs at the next Board meeting, that's fine, too. We don't, at this time, have cement companies that are beating down our door to join the Registry. So if we wait until April, that's fine.

But what the Registry does is that we provide the means whereby companies in California and beyond register their greenhouse gas emissions in California.

Our process is not necessarily to wait for a protocol to be developed, and have that question trigger the development process of a

protocol.

What we do, what we're about is to provide guidance and information and procedures to companies should they so choose to join the Registry. So therefore we believe it's appropriate to develop a protocol for cement companies that we have in our stable of other protocols before a cement company joins the Registry, as long as that protocol, itself, adheres to the practices that the industry believes is solid.

This does not go -- this is not without precedence. The Registry developed a forestry protocol. We have no forestry companies that are members of the Registry at this time.

Any last questions or comments?

DR. RAU: Is this it? Will the meeting be over after you're through, or --

MR. McCORMICK: I believe so, yeah. I mean I'll stick around for a little bit, but other than that --

DR. RAU: Yes, I have --

MR. McCORMICK: Okay, sure.

DR. RAU: -- question or two. Greg Rau; I'm with UC Santa Cruz and Lawrence Livermore Lab.

The overall objective here is to come up with a fair, accurate way of recording CO2 emissions.

MR. McCORMICK: Right.

DR. RAU: And then ultimately in the future, hopefully, recording reductions in those emissions.

MR. McCORMICK: Right.

DR. RAU: Now, these protocols, to what extent are they set in cement, if I might use that. In other words, is there any flexibility down the road for new technologies that might benefit CO2 emissions, but somehow are going to be missed by the protocol that we set today, or that you're going to set in accounting? Is there any sort of flexibility --

MR. McCORMICK: Yes.

DR. RAU: -- or modification possibility?

MR. McCORMICK: Yes. Thank you for asking that. The Registry, we do not believe that -- this is a new field that we're entering into generally, the climate change field, generally, plus greenhouse gas accounting.

Developing these protocols and guidance

for taking an inventory is an iterative process. The process, itself, to develop the first version of the document, there was more than one draft. Of course, this is a common procedure.

Once the Registry has adopted protocols we welcome comments and feedback on the applicability of them, the usability of them, any problems or errors that are included in the documents that have not been detected. Any gaps, any new or innovative technologies or practices that the protocol misses. Those are all reasons for the Registry to open up and revise the document to make it more current and to make it more relevant to the applicable companies.

The Registry, for example, is in the process of revising its general reporting protocol. There were changes made to it that diversion, too, will be not substantially different, but there are areas in which the Registry has revised its thoughts on its guidance. And that same procedure, that same process will fold into the industry-specific documents, generally, as well as the cement protocol, itself.

And there is a mechanism of form for companies or individuals to comment and provide

feedback on the existing documents that are available. And those forms are available on the Registry website.

DR. du VAIR: Mike, also the Registry has a policy document on protocol development, both policy and process. So you can find out what the process is that they have.

There is a recognition that many of these protocols are evolving. And so -- it's a tough tradeoff, because once you start reporting with a particular protocol, you sort of want to be able to look back at past years --

MR. McCORMICK: Yeah.

DR. du VAIR: -- and if you keep changing the way the rules of reporting are, if you can't do a straight crosswalk back to the prior method, you can't look back very far with comparable types of inventory.

So, a bit of a tradeoff between how often you change the protocols. But ideally, you know, when new methods are developed and it's more accurate, or there's new monitoring approaches to things like that, these protocols have to be flexible to handle that.

As well as the international arena

moves. There's an ISO, what is it -- I always forget the number, it's like -- it's 14064 or one of those numbers -- there's an ISO on greenhouse gas emissions; it's fairly early in development, I believe, and I'm not sure how far it gets into specific sectors at all.

So I know there's obviously a number of international efforts at protocol development that need to be monitored. Once some decisions are made there, as well as at the federal level, I think the state registries, and there aren't that many state registries that are really that viable. For awhile there were a few, but I think New Hampshire and Wisconsin both have some efforts. But this Registry, as well, has got to follow what's happening in other areas to be able to move with it.

But I also have another question, Greg, if you -- and it actually sort of follows on that, Mike, and the question I have here is in a number of areas the Registry allows more than one way to quantify. And, to me, I've mentioned this a lot to the Registry. One of the strong advantages that I had mentioned to the Registry was that it's able to make some decisions and promote some

consistency in reporting.

MR. McCORMICK: Right.

DR. du VAIR: And some very time there's two ways or three ways to report the same source, you potentially have inconsistencies, which was some of the major criticisms of the federal voluntary registry, is that there was no standardization on methodologies to quantify similar types of sources or inventories.

So, I'm seeing here in this protocol, which is a fairly small piece here, that there's a clinker approach and a cement-based approach. And so not being involved at all, and I did read that they're supposed to sort of be all the same number, much like we had in the power sector protocols, where ended up giving the option to use continuous emissions monitors or the fuel, the carbon in the fuel, you've got two different approaches often yielding potentially different numbers.

I mean right at the root of the Registry you got the problem of reporting based on management control or equity share. Or some combination.

So there's a number of arenas where the

Registry hasn't been able to promote one standardized consistent approach to reporting. And so I guess my question goes to the work group. Not knowing the differences between the clinker-based approach or the cement-production approach, what are the issues? How far apart can those two methodologies yield what are, you know, what are the different data sources that are necessary? And which one could be more accurate? And how much more data-intensive is one method over the other, I guess?

Because, again, I'm having the concern that you've got two ways to do potentially the same source. And it's they yield substantially different numbers. One cement member reports one way; another reports using the other; and how comparable are those numbers?

MR. McCORMICK: The cement-based methodology is a throw-back methodology, or archaic in the sense that it was developed, I believe it predates the clinker methodology, or the wide acceptance of the clinker-based methodology.

The reference documents to, and the background of research that was done in the

development of this protocol revealed that there are two basic approaches for calculating emissions from producing cement. One is the cement-based approach and one is the clinker-based approach.

The cement-based approach was developed by ICF for either greenhouse gas accounting registry, WRI, or a cement company, itself. Or maybe it was a federal initiative. I forget.

However, the clinker-based approach has become the industry standard. And some of the comments that I have received were that we should eliminate the cement-based approach, and then only focus on the clinker-based methodology, or only allow for the clinker-based methodology. A) because it's more adopted, and -- it's more widely adopted; and b) that there are less assumptions associated with the steps involved.

There is general recognition that if your data is of a certain level of quality, both procedures should be to same level of emissions.

I included it as an appendix in order to acknowledge that it was a methodology that was used at one point. And it theoretically yields an accurate CO2 emissions profile. However, it is not widely used, or used at all, as far as I

understand. I've not talked to any cement company that uses it.

So, that's a good question for us to consider, whether or not we should just drop it entirely.

So, any of the cement company reps have any thoughts on whether or not it should be dropped entirely, or just --

MR. REGIS: Well, I have to profess to not knowing all the details about it, but clinker-based methodology, are you not counting the kilowatts used to grind clinker into cement?

MR. McCORMICK: Right. The clinker-based methodology does not include the emissions --

MR. REGIS: Separates electricity.

MR. McCORMICK: Yeah, it separates out. It only focuses on the conversion of limestone, CO2 emissions from that.

MR. REGIS: Most of our opportunity to reduce CO2 emissions are in either power efficiency in finish grind.

MR. McCORMICK: Right.

MR. REGIS: There's a big developing field of --

MR. McCORMICK: Right.

MR. REGIS: -- much greater efficiency.

MR. McCORMICK: Right.

MR. REGIS: Or through the additive, the addition of mineral admixtures to the cement.

MR. McCORMICK: Right. And the addition of admixtures to the cement could be captured here depending where along the continuum those admixtures are input into the clinker production process.

MR. REGIS: They're after clinker --

MR. McCORMICK: They're after clinker. Well, there is a cement efficiency metric which enables participants to demonstrate the impact of those emissions on the final cement product. The calculation methodology, itself, applies to the clinker manufacturing, the process emissions associated with clinker manufacturing.

We have separate guidance that is used for CO2 emissions from fossil fuel combustion, the energy.

MR. REGIS: Clearly the process-based CO2 from the calcination of limestone is captured in the clinker most easily.

MR. McCORMICK: Right, right.

MR. REGIS: And the fuel is almost all used in clinker, but not all.

MR. McCORMICK: But if you take an entity-level inventory, you calculate your fuel use from either burning the fossil fuel or by using electricity. So, those emission sources are folded into your report. And changes and decreases in those would be recognized.

DR. du VAIR: Yeah, they're already captured in the general reporting protocol for stationary combustion of fossil fuels, and the electricity, as well, so.

MR. REGIS: Nationwide a lot of companies are using the ASTM C150 to add limestone, intergrind limestone to cement, which we're not able to do here in California. And that's just a straightforward reduction in greenhouse gas emissions per ton of clinker -- per ton of cement.

So, by going to clinker-based, are you not allowing -- eliminating that option?

MR. McCORMICK: No, no, no, --

DR. du VAIR: Not at all.

MR. McCORMICK: -- because the emissions report is more than just the clinker based. Your

ultimate emissions report to the Registry is more than just clinker based. It's also the fuel use, downstream and upstream.

DR. du VAIR: And I believe that's a whole separate question in terms of --

MR. REGIS: Yeah, --

DR. du VAIR: And then Tom would be probably more able to answer the issue of what's allowable on these admixtures or things -- or issue.

But the key here is that this is really what's called industry-specific protocol. And it does just focus on how do we better estimate the greenhouse gas emissions coming from a cement company that has operations in California.

MR. McCORMICK: Right.

DR. du VAIR: And so you clearly want to get the calcination and you want the best way to calculate CO2 coming out of that process. And it sounds like, is the clinker methodology the most accurate way to get at the CO2 from the calcination process?

MR. REGIS: I would say it's -- yes.

DR. du VAIR: Yeah. So you definitely want to be able to have the best method for each

source. And then what you were saying potentially is in the end you can, what, displace more cement? You have to essentially create less of it, but you can add --

MR. REGIS: You can change the ratio of clinker to cement.

DR. du VAIR: Right, right. And you capture that in the efficiency metric where you have tons of CO2 -- or pounds of CO2 per ton of cement or whatever. That's where you see that reduction, if you're allowed to add a lot in the end. When you calculate that efficiency metric you'll see the CO2 drop per ton of cement.

But that's a separate issue from what your total actual greenhouse gas emissions are from the facilities in California.

MR. McCORMICK: If you open up a general reporting protocol for the Registry, you will notice that it does not include guidance on the process emissions from manufacturing cement.

And so that's the gap that this seeks to fill. Is so if there -- if, in the general reporting protocol, which has guidance on stationary combustion, which has guidance on mobile combustion, which articulates the reporting

rules for the Registry, if that also had the clinker-based methodology embedded into it, which it didn't have when it was written, then this protocol potentially we would not have needed the protocol. But in the absence of that we needed to augment that with new industry-specific guidance.

And during that process we believed that rather than just making a two-page, like technical calculation worksheet, we'd also provide a bit more information about the Registry's program and the reporting rules. Because we realize that people are going to open this up and read it as if it's a stand-alone document.

It's not a stand-alone document. So, we try to provide a little back story in it. And then point people to the general reporting protocol for more comprehensive guidance.

Also, we're able, in this protocol and this document, in the protocol process, to establish an efficiency metric that is particular to this sector, which also is absent from the general reporting protocol.

So, there's two gaps ostensibly that this document aims to fill, is on the straight-up calculation of process emissions from the cement

company, and then also an efficiency metric.

DR. du VAIR: So I'll repeat my concern that if there's two methodologies being allowed, if they substantially deviate from one another, that's potentially a problem.

We prefer that the Registry adopt one more standardized approach to estimating a particular source.

MR. McCORMICK: Sure. Okay.

DR. du VAIR: The other question I'd have is --

MR. McCORMICK: And just real quick. In response to that, I will look in to identify the level of potential variance between the two approaches and decide whether --

DR. du VAIR: That would be good. And the data requirements.

MR. McCORMICK: Yeah, and the data requirements, to determine whether or not -- and I'll seek input from interested parties, to determine whether or not we should keep the cement-based approach, or whether we should just exclude it in its entirety.

MR. MAGNANI: Is this cement-based approach part of the WBC?

MR. McCORMICK: No. That is not. The cement-based approach is a methodology that was produced by ICF. And it is not included within the WBCST protocol. It's outside of that.

MR. MAGNANI: And have you had any written comment, or anyone from the working group support the cement-based?

MR. McCORMICK: No. I've had a couple of comments cautioning against including it.

And I kept it in thus far because there's always been that clinker-based approach, and so there is the opportunity. So, I haven't excluded anything.

And the idea to provide more flexibility, more options, more opportunity for a cement company to participate. If, for some reason, a cement company has management systems and information, data-gathering systems that were developed in accordance with the cement-based approach, then I thought it would be useful to allow them to continue that process if, and only if, the cement-based approach would yield the same level of accuracy on emissions as the clinker-based approach.

Theoretically it should, but I'll dig

back into the actual data requirements. How widely it is used. And so, I mean if I just take it out entirely, the question is what difference would that make to anyone. And it may be if everyone's using the clinker-based approach, then it wouldn't make any difference whatsoever.

MR. MAGNANI: I think you included it for the right reasons.

MR. McCORMICK: Yeah.

MR. PYLE: My thought on that is that if it is going to be verified, is that I think that in the calculation of somebody who's going to come in and verify the number that that provides a lot of substantiation to whatever number you get.

What I think should be outlined is that if you start with one method, you would need to stay with that method. Because that's where chances for discrepancies would probably most likely occur if there was a switch.

DR. RAU: I had another question.

MR. McCORMICK: Yeah.

DR. RAU: Will these measurement protocols deal with say CO2 emissions offsets? In other words, let's suppose the company goes along, business as usual, so much CO2 generated per ton

of cement, but it decides it's going to plant trees, or decides it's going to buy CO2 emissions credits. Will that be credited towards its net emissions or not? Or is that a separate issue?

MR. McCORMICK: Yeah, it's a separate issue generally. This protocol would focus on the absolute emissions that are coming out of the company.

If the Registry expanded its program to include offset registration, which we don't at this time, to register emissions reductions so a cement company or any other company actually can go somewhere and go plant trees within California. And then account for the CO2 that is picked up into that activity.

They can register those emissions with the Registry and their emissions report can reflect their absolute emissions from their entity, plus the emissions reductions that they have registered.

This protocol, this document, itself, would not include guidance on reductions. That would be a separate document.

DR. RAU: That's something in the future that's been thought about --

MR. McCORMICK: And that's something in the future, yeah.

DR. RAU: Okay.

DR. du VAIR: Well, Mike, if a cement company owns some forest acres and right now they're doing management practices on those forest acres, the forest protocols that the Registry has would be applicable.

MR. McCORMICK: Yeah.

DR. du VAIR: And so they would need to report on those company activities. And potentially could report a project using the forestry protocols.

DR. RAU: Yes, and could report an emissions credit, a net uptake of CO2.

DR. du VAIR: Yeah.

MR. McCORMICK: Yeah.

DR. du VAIR: Following the forestry protocols, yeah, sure.

DR. RAU: Yes.

DR. du VAIR: That is the one area where they do have project-based protocols is forestry.

MR. McCORMICK: Right.

DR. du VAIR: I also have a question about I heard something to the effect of tires

being used in the cement industry. And I'm curious if that is another source besides calcination, that the general protocol and all of the combustion emission factors and everything it has is -- are tires well captured as a source of greenhouse gases? Or is that a particular area where the cement industry may also need some additional guidance?

MR. McCORMICK: Yeah, as far as the tires are concerned, cement companies know how many tires they burn, they count each one, right. And so as far as accuracy of fuel input that is well known.

Tires --

DR. du VAIR: Although not all tires are the same size.

MR. McCORMICK: Not all tires are the same size, but the emissions associated with burning, as far as I understand, the cement companies and kilns, they can eat anything. But the difference in size in tires does not -- there's not a dozen different emission factors associated with the different size of tires.

The standard practice is to apply an emission factor to the number of tires burned. So

it's treated similarly as other fuel use. You account for the amount of tires, the number of tires burned, just like you account for the amount of coal used and apply an emissions factor to it. And that would yield CO2 level associated with burning tires.

The question then becomes are tires considered an anthropogenic fuel source, emission source. Or are they considered biogenic and should they or should they not be included within your inventory. And the accepted practice is to keep them within the inventory. They are a fossil fuel source. They have -- there's a whole set of, and a lot of co-benefits with burning tires. But from a climate atmospheric perspective it is still producing CO2 and other greenhouse gases into the atmosphere.

So the protocol does treat it. It provides an emission factor. And the number of tires used is well known. So.

MR. PYLE: Pierre, if I can -- I'll get close to the mike so I don't get scolded -- we were very interested in looking at tires with respect to concrete pavement as the asphalt pavement industry has been pushing -- in fact,

they just pushed a bill through in this last legislative session to mandate what we already do. And that is to mandate that tires be used in asphalt pavement. We -- unfortunately it doesn't mandate California tires.

When we were looking into tires in concrete pavement, though, we discovered that the tires used in concrete pavement for accounting purposes, a lot more tires are used per square yard of concrete pavement than asphalt pavement, which we found to be very interesting.

As we looked into it a little bit more, we did some work, and I cannot remember the name of the professor from the University of California at Davis who -- if you Google-search that you would discover there are some folks who are very opposed to this process.

It doesn't matter to me whether, you know, we burn tires or not, but I would like to express that their concern is all of the additional gases which are put into the atmosphere which are pretty nasty, in their estimation.

DR. du VAIR: You're talking air toxics?

MR. PYLE: Yes, yeah --

MR. McCORMICK: Criteria pollutants --

DR. du VAIR: And criteria --

MR. PYLE: These are toxics which are not regulated in terms of dioxides and others, which are potentially pretty harmful.

MR. REGIS: But that's inaccurate.

MR. McCORMICK: I'm not suggesting that the report is accurate or not.

MR. REGIS: Well, you're entering into the record --

MR. WALES: This is Richard Wales. The whole issue of burning tires versus burning coal, our experience has shown us that the toxics equal out.

MR. REGIS: That's what our data shows, as well.

MR. WALES: You get toxics while burning coal that are slightly different than the toxics while burning tires, but when you take the total sum and look at the overall emissions and the risk downwind, or that impact downwind, it turns out it doesn't matter whether you're burning coal or you're burning tires.

And I know there's a tremendous misperception out there. Coal is a very dirty fuel. Actually, probably tires might be even a

little cleaner. And in California those emissions are regulated under AB-2588, because you look at the downwind; you don't look at the emissions each -- but you look at the impact upon the nearest receptor.

MR. PYLE: Well, from my standpoint I would like nothing more than -- I'm coming into this subjectively, and not an expert in this. There's nothing more I'd like to say than that concrete pavements recycle more tires than asphalt pavement. Okay? And I put that into the record.

What I would like for people to be aware of is that there are people who are concerned who are more knowledgeable on this than I am.

DR. RAU: Is this in the --

MR. WALES: Well, --

MR. McCORMICK: No, this is in the burning -- in the --

MR. WALES: -- like I say, it works out evenly. And I hate to say it, but L.A. Basin with 13 million tires, I don't know if there's enough use in the asphalt industry. And putting tires into asphalt does create emissions because of the VOCs that are generated. And most of those plants do not have the temperature to destroy the VOCs

while bringing that liquid asphalt up with the rubber in it to the right temperature mix.

Whereas, the cement kiln with the 2000 degrees will destroy those VOC emissions.

MR. PYLE: Yeah, well, I don't disagree with that. The other advantage is that the entire tire is consumed, and I understand from at least one manufacturer of cement, that the steel belts in the tire are even included in the calculation of the clinker for ferrous which is needed. So there are a lot of advantages, but --

MR. WALES: Using those tires, and I won't call it burning tires in the cement kiln, yeah, there is raw material gain. And approximately 20 to 30 percent reduction in the oxides of nitrogen emissions, which is, of course, not a greenhouse gas, but it is a problem towards our ozone. We love to get that oxides of nitrogen down, and tire burning does generate less oxides of nitrogen from a kiln than burning of other fuels.

DR. du VAIR: Actually, tropospheric ozone is a warming gas and so VOCs contributions to tropospheric ozone should have some (inaudible) in law, right? Some of the IPCC documents will

show you that tropospheric ozone has warming properties.

But I think the critical question here is -- there aren't any policy calls here on this. The critical question is, you know, do these protocols capture these sources? How do you measure the CO2 that comes from the use of tires at cement facilities? And do these protocols have the right emission factors and the right data requirements to accurately capture that particular source?

And so, I mean, you can put a monitor out there and probably potentially measure the combustion of tires and the gases coming off. And you can probably get some ideas of how accurate the emission factors are. And I'd assume some testing's been done on the air emissions side. Richard, you may know, in terms of whether some air sampling's been done.

And then do we have the right emission factors in this protocol to accurately quantify that particular source for the cement industry.

MR. McCORMICK: So my response to that is I believe the guidance that is included in the document provides sufficient information for

capturing the GHG emissions associated with burning tires.

The procedure is similar to calculating procedures of other fuel sources. And the emission factors that we have taken have come from a source that we believe is solid, and we have received no feedback that the emission factor is off, or that the manner in which we described for calculating it is off.

So, we're comfortable.

DR. du VAIR: Well, other fuels like liquid fuels, I think they know the carbon content pretty accurately. Just a number of tires versus a weight, say, per pound of tires I think you might know carbon content much better.

Again, I'm also unfamiliar with, you know, sort of the chemistry behind all of this. So I don't know how accurate counting tires is versus if you had a weight for how many pounds of tire you burned or something, would seem a little more accurate, but --

DR. RAU: Just do an average. I mean, you know, with a calculator. Take a subset of tires --

DR. du VAIR: Right.

DR. RAU: -- and get an average, and then you've got x number of tires; and you multiply by the average and --

DR. du VAIR: And if that average has very little -- I mean if it's a pretty standard average, then, yeah, that's going to be accurate enough.

MR. REGIS: That's what we did when we started burning tires at our Colton plant. We weighed trucks in; burned and count those tires. And we did that periodically and compute an average weight.

DR. du VAIR: And average weight didn't vary a whole lot?

MR. REGIS: Not -- well, depends on how you define a whole lot, you know, --

DR. du VAIR: Right.

MR. REGIS: -- but, no, and then --

DR. du VAIR: That's what registries are all about.

MR. REGIS: Well, and then --

DR. du VAIR: To define what's a whole lot.

MR. REGIS: -- well, this kind of detail over a secondary fuel source is exactly the kind

of morass that we don't want to get into in reporting.

DR. du VAIR: If it's a trivial source, yeah. I would agree. And again, I have no idea what the magnitude of this source is. You know, but like fugitive emissions per power generators or utilities of methane, it's a significant source even though it's, you know, the bulk of their emissions are from the combustion at the natural gas power plant.

So it's just, again, knowing what the sources are, what the relative magnitude. The Registry has provisions for de minimis sources. You only have to capture 95 percent to begin with. And then when a certifier comes in, if their estimates are plus or minus 5 percent it still gets certified. You could have as much as 10 percent variance in the total emissions inventory.

So I mean there's a lot of flexibility --

MR. REGIS: Tires don't vary by 10 percent.

DR. du VAIR: Yeah, so.

MR. REGIS: But if you want to get into details, every fuel has ins and outs. Oil has

water in it.

DR. du VAIR: Oh, yes.

MR. REGIS: Coal has partings in the coal seams. Every fuel has something that comes and goes.

DR. du VAIR: I know, carbon content of coal and oil can vary quite a bit, right, methane, certainly, and all.

MR. REGIS: The Btu, the therms per mcf gas vary.

DR. du VAIR: Yeah. So the feedback you've gotten is that this source is, what you've got in here in protocol is sufficient to adequately capture that source.

MR. McCORMICK: Yeah.

DR. du VAIR: That was the main question.

MR. REGIS: I had one question on biofuels. Have you had much feedback on that, and I'm a little confused on actually what constitutes a biofuel. I know that in Europe the use of animal meal is a major fuel source for that. But I'm assuming that that's where this exemption came from.

MR. McCORMICK: Sure. If you can

document that you use a biofuel to power an emission source, then those biofuels are considered biogenic by the emissions -- or by the Registry, and those emissions are not included in your emissions report.

What constitutes a biofuel is that it is derived from a biomass. Biomass is generally considered waste material from organically -- not organically grown, but organic material waste, waste material that was recently alive, and from a place that is reasonably considered will be regrown.

That's not the standard -- I didn't articulate the explicit definition, but it's generally understood to be waste material, or recently grown, live -- or recently alive organic material from a location in which organic material will be regrown after it.

And the concept, the idea behind it is that the emissions associated with burning that organic material and produced up into the atmosphere is re-absorbed by the material that is replanted after it. And so it's a cycle, and there's no net emissions.

DR. du VAIR: You don't want to trade

deforestation, is what you're saying, for necessarily for a power source.

MR. McCORMICK: Right. Right.

DR. du VAIR: If you're looking at what ends up in the atmosphere. What you're saying is if you're taking biomass out, it's got to be able to naturally replace it, otherwise it's not a net zero.

MR. McCORMICK: Right.

MR. MAGNANI: So an example is -- would an example be say a lumber company uses its scrap material from its lumber processing --

MR. McCORMICK: Yes.

MR. MAGNANI: -- as cogeneration to --

MR. McCORMICK: Yes.

MR. MAGNANI: -- power the plant. And they have a timber harvest plan where they're regrowing.

MR. McCORMICK: Yes. That is an example. So, if you were getting clippings from a lumber mill, or not from a lumber mill, from a lumber company. And those are, you know, waste clippings that they have no use of and want to get rid of. And then they give them to you such that you put them into your fuel feedstock.

The emissions associated -- you have to determine how much biomass you're putting in, because the way to determine emissions is based on fuel input. So you get an amount. And then you apply an emission factor to that amount. And then you put that number in a different box than the --

MR. REGIS: Even though we don't own the lumber company?

MR. McCORMICK: Yeah, even though you don't own the lumber company. As long as you know that they're going to regrow the material that they're supplying to you as biomass.

DR. du VAIR: And the way you'll see it is that your fossil fuel use will go down, because you're burning biomass so you should see your fossil fuel use drop, is the way it will show up.

MR. McCORMICK: Right. And that's how it'll -- your emissions report, therefore, from one year to the next will reflect the increase, or the decrease in CO2 emissions or GHG emissions from fossil sources.

DR. RAU: Will we get a list of participants that were at the -- is there going to be any follow-up sent to us from this meeting by email or anything?

MR. McCORMICK: Sure. Good question. I will put up on the Registry website my presentation. And also a list of attendees. And I'll give that to you, too, if you want to put it up on your site.

DR. du VAIR: Why don't we commit to on the 23rd compiling all of the comments. And if there's not a huge volume, which we don't expect, we should be able to scan them and could email them to people that have provided us these emails. Why don't we sort of do that.

MR. McCORMICK: Sure, that'd be great. Yes?

MS. FACCA: I have a question. This has to do with what's in the protocol, itself. And you mentioned it here. Is there a standard of appropriate consideration for the membership? I didn't see, I didn't pick up anything in reading the protocol and in reviewing this documentation as to what an agency -- what standard they're held to for appropriate consideration for us joining the Registry.

MR. McCORMICK: Oh, you mean when we talked about that the state will pledge to use best efforts to provide appropriate --

MS. FACCA: Well, no. This goes back to your presentation saying that if Hanson Permanente Cement joins the Registry, we go through the pain and agony of doing this, --

MR. McCORMICK: Right.

MS. FACCA: -- including the cost of having an independent third party come in and certify, what bang for the buck do we get for this? Because it's not going to be cheap. And, you know, --

MR. McCORMICK: Right.

MS. FACCA: -- I was a regulator for ten years. And, you know, you can say a whole lot of things and it's weasel words. So, I mean, is there a standard for appropriate consideration?

MR. McCORMICK: No, --

DR. du VAIR: We both could try and field that. Why don't you take the first shot at it.

MR. McCORMICK: Well, the state has put on the record that it will, to the extent possible, provide appropriate consideration. You question is what does it mean, what does appropriate consideration mean.

MS. FACCA: Yes.

MR. McCORMICK: That is not defined. I cannot sit here and tell you that if the state implements a cap-and-trade program or some sort of carbon limitation program, and requires cement companies to participate, they will reward Registry participants like this.

That is not known. I can't say it because it hasn't been defined.

At the same time, the state is on record as saying that it will seek to recognize, or that it will recognize the early action activities from companies.

And throughout the development, or throughout the Climate Action Team process to develop an implementation plan for the Governor's reduction targets, consistently the Climate Action Team has said that it will -- that it wants to reward early actors.

So, although the state doesn't have in writing and in statute explicit language on how it will reward early actors, that message has been recognized by the state implementation team.

As well, they are being continually reminded of it by Registry participants, as well as other actors in California who recognize that

if a climate limitation, maybe a cap-and-trade program, comes down the pipeline sometime soon, that how they are treated in that cap-and-trade program should recognize what they have done beforehand.

Registering emissions with the Registry is one activity. Doing energy efficiency; renewable energy purchase activities. Those are all actions that these companies are reminding the Climate Action Team to recognize.

And the Climate Action Team has taken note of that, and has said that it wants to reward early actors.

Now, it hasn't produced any document yet which demonstrates it is rewarding early actors. So, the best I can tell you is more or less that.

Do you want to add --

DR. du VAIR: Yeah, I've got a number --

MR. McCORMICK: -- is that -- I mean it's not satisfactory --

DR. du VAIR: -- of points to add.

MR. McCORMICK: Right, I mean it's --

DR. du VAIR: First, Mike, there was a lot of interest at the federal level, as well, regarding how to provide acknowledgement of early

emission reductions.

And I think that some issues came up about current Congresses binding future Congresses by having a current Congress make a commitment on some future scheme, and essentially tying the hands of future Congresses. Same thing at the State Legislature. I think they recognized in 2000 they can't put a whole bunch of very specific language in a statute now that binds some future state legislature to, you know, to recognize some particular types of actions now in the future.

So, there was a lot of concern about this being a rapidly evolving field and sort of binding or tying down future legislative efforts.

Nonetheless, they recognize the state really -- it's in the best interests of the state to try and promote early action. So, I don't think they could go much further than saying provide appropriate consideration.

And I think you do need to fall back on what Mike's saying, is that the current Climate Action Team and the power sector has done a lot of early reductions, and they're very interested in trying to better understand what types of acknowledgements they may get for some of their

early reduction efforts.

The State Legislature ultimately is going to have to create some new types of legislation that deal with greenhouse gases, and that's where ultimately the clarification will come. And so it's going to be decided much more in the legislative arena than it can be right now by -- I mean currently the legislation doesn't even define what the state is when it says the state will give appropriate consideration, you know. Who's the state, or what entity, or is it a single entity?

It probably is the State Legislature, because when they do move to a mandatory system it's going to be new laws that will establish how that system is implemented. And when it creates, you know, if it creates, you know, industry-specific requirements to help meet a state target or a federal target, that's where the new laws will be able to say, you know, if you've documented these reductions, you're, you know, -- this industry only needs to come up with, you know, less reduction or something.

It'll be in the legislative arena where that acknowledgement and how much credit for early

action gets --

MR. MAGNANI: Well, I think that there's a potential that could be through the legislative arena, but the Climate Action Team is completely an administrative process initiated by the executive order.

And the message being sent by the business community, whether it be power or any other business community, to the Climate Action Team is we want consideration for past actions, or early actions. And we don't want to be penalized for our early actions in comparison with other industries.

But I don't -- I think that there's potential for legislative action in the future that may regulate. But clearly there's administrative function taking place right now that could potentially be industry-specific in what they're asking for my means of reductions.

So, it's not accurate to say that that's the only place it's going to be. I think it could potentially be one, the other, or both. But the message being sent is the government needs to consider early action. But it's ambiguous as to what that will be.

And my personal advice, I'm not speaking for anyone else here, is participate in the Climate Action Team workshops. I know we're representing the cement industry in those activities.

DR. du VAIR: And document your reductions, right? So that you can get credit.

MR. MAGNANI: Document your reductions. And that consideration has no tie to the Registry, no offense, you know. But whether or not you take early actions or not, account for it and calculate it, and be able to present it in a cogent fashion.

But there's no mandate that you're only going to get consideration if you're a member of the Registry. If you're an industry that's taken it upon yourself to act early, document it and make sure you're loud and vocal about asking for it in the future.

DR. du VAIR: I would argue that you probably have better opportunities to get credit if you do follow the Registry's protocols and get them independently verified.

MR. MAGNANI: You may.

DR. du VAIR: Yeah, it's not --

MR. MAGNANI: I don't know that I agree

that that would be correct, but you may.

DR. du VAIR: May. Well, it's on the state books and the Health and Safety Code.

MR. McCORMICK: That's fine, but I would say if an industry can document it, I don't know that it's necessary -- the Registry may help you --

DR. du VAIR: Right.

MR. MAGNANI: -- maybe overcome a hurdle. I don't think it's necessarily, and we all know life's not fair, but I don't know that it would be a fair way to allocate considerations just by the sole fact that you are a registered member.

MR. McCORMICK: At a minimum you'll have to field questions as to why you are not a Registry member.

MR. MAGNANI: Which would be another thing I would say is not necessarily appropriate. The industry has to defend themselves in that regard, but that's a business decision.

MS. FACCA: And the other is a comment on your discussion earlier of clinker versus cement. One of the things that California has always been looked at as a leader in the formation

and promulgation of regulations.

And by the Registry potentially making a decision to go only with a clinker-based calculation versus a clinker and cement calculation, is that you are setting the stage for other states to come in and potentially exclude a viable calculation.

And that's something that you should keep in mind, because when you set forth a policy that says, yes, industry is going towards the clinker-based, and that's the one that our industry has said that we prefer to use, there were dissenting votes on that. And there were a number of companies that said, no, we disagree that the use of the clinker-only-based factor should be used. Which is why the cement factor still exists.

And by California, whether it's the CEC or ARB or the Legislature in general saying the Registry is right, and the clinker analogy is the one we will use, you preclude the use of that cement calculation. Which leads other states to follow in your footsteps.

MR. MAGNANI: I think it gets back to my earlier comment, I think you included it for the

right reasons. Because you don't know who else is going to be following your lead. And if it is an accepted industry standard somewhere then it probably should continue to be included as an alternative.

DR. du VAIR: Well, it sounds like an and in there where you can use both the clinker-based approach and the cement-based approach, --

MS. FACCA: And/or.

DR. du VAIR: -- or some combination?

MS. FACCA: It's an and/or. You can use one and the other; or the other. And I'm just saying there were dissenting votes. It was not this unanimous, oh, we all love it and we're taking this one and running with it.

DR. du VAIR: Well, that elevates the question then of how different can the numbers come out of the two methods. And the Registry really then needs to weigh, if the numbers are substantially different, then it's potentially an issue of inconsistent reporting of the same source.

MR. McCORMICK: Well, I mean because there's two methodologies there's always the potential for meaningful differences. What we

need to do is put parameters upon the input data that feeds those calculations such that as they work through the calculation they don't end up with significant variance.

So, the key point is to make sure that we have guidance that would yield accurate input data.

MS. FACCA: And it can easily be solved by saying choose one or the other, and going forward you must use this one in perpetuity. Or you must go back and recalculate using the other.

Because once you make a commitment to a single equation you need to stay with that, that calculation choice.

MR. McCORMICK: Right.

MS. FACCA: You can't switch horses midstream and say I don't like the number the clinker is giving me in year three, I'm going to now switch to cement because it gives me a better number.

MR. McCORMICK: Right.

MS. FACCA: Because you can easily deal with that by a parameter stating that if you're going to switch you must go back and reevaluate and have your numbers reevaluated by your

independent third party.

MR. McCORMICK: Sure. Okay. That is guidance that we have standing on the books right now, as well, with respect to how a company draws their organizational boundaries. That is whether they choose to report based on their equity share of the company or over the facilities that they have control over.

And then once they decide whether they're going to report based on equity or management share, they have to continue that going forward.

And so that comment is well received, and I'll make sure that it's included in this document so that cement companies know if they choose to go with the clinker-based approach or the cement-based approach they must pick and stick.

DR. du VAIR: Any additional comments?

MS. FACCA: No.

MR. McCORMICK: And then also with respect to the differences between numbers, between the two calculation methodologies, this is where the value of the independent verifier comes in. Because they would double-check the input

data to determine whether or not the methodology, itself, would yield an emissions level that may be reasonable. So, it's not a fail-safe way to address Pierre's concern, but it is a way in which the Registry's program does have a check on that.

For example, they could check, they could use the clinker-based methodology as a check on the cement-based methodology.

MR. REGIS: Do you have a guesstimate on how long the verification would take?

MR. McCORMICK: Well, it would take longer the first year as opposed to like second and third year. And the cost likewise precipitously drops down.

The timeframe that we have generally set up is that reporters report midyear. And then the certification takes six months thereafter. There's a six-month window thereafter.

That doesn't mean that the certification actually works that long. I would imagine that because the cement companies have a few sources that produce the bulk of the emissions, the review on those sources -- because it's a risk-based review of the certification process, the activity is not to go in and to replicate a company's

inventory. It's to evaluate the company's makeup; identify where the large significant emission sources are. And then do a risk-base analysis.

You say, all right, I'm going to recalculate this source. And if I'm within this level of accuracy or likeness, then we could move on to the next one. And then that defines the certification process.

So therefore on timing, because the cement company, there are relatively few emission sources compared to other operations, like an oil and gas entity, it would probably take -- educated guess here is three to four months.

DR. du VAIR: Yeah, it definitely does depend on the complexity of the operations, if a cement company is involved in forestry activities, obviously, or other activities.

It depends on your boundaries. If it's California only, versus U.S. And then number of facilities and the types of activities that this cement company might be involved in.

If they're strictly just making cement, yeah, and they've only got three or four facilities in California, it's going to be a fairly straightforward certification compared to a

municipality or a university that can have lots of different sources and no one big source. And so each of the smaller sources are not de minimis and things.

So, it, you know, a company like BP is going to have a more complex one, I think, than any cement company obviously ever would, so.

MR. McCORMICK: Right, right.

DR. du VAIR: On the scale of things, I think the certification of the cement industry is much more straightforward than a lot of the other industries.

MR. McCORMICK: I presume that there's, you know, audits and certification and verification work with ISO, and then other compliance, emissions compliance.

And so, I mean, the certification process that we have defined is like the ISO verification process. And so I would imagine that the timeframe is similar.

MR. REGIS: There's very few U.S. companies doing ISO for cement. And to be honest, we purchase a lot of materials, and being ISO certified has virtually nothing to do with the quality of the material that arrives on site.

DR. du VAIR: A lot of the speed on the certification probably also depends on how well you've done your inventory, what types of data management systems you have in place, and how clear your --

MR. McCORMICK: That's a good point.

DR. du VAIR: -- the certifier will look at all of that and if that's well organized and kept in very good data management systems it's going to go quicker.

MR. REGIS: Well, the more the certifier knows the longer it will take because he'll do stuff like check the XRF curves that generated the chemical analysis. Okay, there's two weeks worth of work, depending on how detailed it is.

MS. FACCA: Yeah, because generally ISO certification takes up to anywhere between nine and 18 months to achieve the first one. And after that, your annual check takes about six weeks.

MR. McCORMICK: I don't think we've had anyone that has had an 18-month certification.

DR. du VAIR: No.

MR. McCORMICK: I think that because CO2 is an emission source that is a calculation to arrive at CO2 and GHG emissions, it's relatively

straightforward. It's based on fuel use most predominately. And in this case, the calcination of the limestone.

There are few data sources and inputs that are relatively easy to get a handle on. And that cement companies know this information up and down, and have management systems in place already to know how much clinker is produced on a daily, weekly, monthly basis, down to a very high level of sophistication, as well as they measure each and every tire that goes into the kiln. They know exactly how much fuel use, coal and oil.

And so these are the pieces of information that is needed for GHG verification and calculation. So we're lucky in that respect.

I'm happy to -- we have time to -- we have time. There's no reason to rush. If we want to take a break and come back, I'm happy to spend all day. And I can let Tom and Pierre, if they want to do something else.

At the same time, if people don't have any questions, and you know, want to sit and digest some of this information and get back to me, that's fine, as well. The public comment period is still open.

I'm going to, if you don't have my card, please pick it up and we can talk and chat about the protocol development process, and I can answer any questions offline, as well.

DR. du VAIR: Yeah, I would agree with Mike, written comments are very helpful. So if any of you do have additional comments, definitely feel free and motivated to send in written comments.

With that I think we will break for lunch. And it sounds like we're going to actually convene, or wrap it up, adjourn if nobody else here has additional comments.

Richard, are you still there, or did we lose you, on the phone? Or anybody else on the phone?

No. I think we've worn them out.

Okay, thanks.

MR. McCORMICK: So we'll break for lunch, and we'll break for the day.

DR. du VAIR: Yeah, I think we're going to adjourn because it doesn't sound like anyone else has got additional input here with the group. So I think we'll adjourn.

And then, like I say, please do consider

sending written comments in to the Registry or the CEC, and we will send out all written comments we received, at least to this email group here.

(Whereupon, at 12:57 p.m., the workshop was adjourned.)

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CERTIFICATE OF REPORTER

I, PETER PETTY, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Joint Public Workshop; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said workshop, nor in any way interested in outcome of said workshop.

IN WITNESS WHEREOF, I have hereunto set my hand this 25th day of November, 2005.